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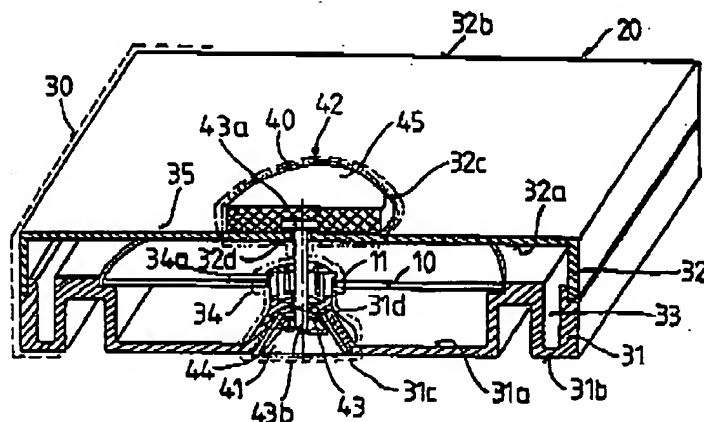
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(54) Title: GOODS PROTECTION UNIT



(57) Abstract: The invention relates to a goods protection unit against the theft of information-carrying discs with a central aperture, especially CD and DVD discs, which has a housing surrounding the storage space that is suitable for accepting the information-carrying disc, the housing has one housing member and another housing member that can be moved as compared to it, the one housing member and/or the other housing member has a clamping part-unit serving to temporarily hold the information-carrying disc on the inside facing the storage space, furthermore, the one housing member has a supporting zone, and in the closed state of the housing the supporting zone is positioned in the

projection of the central aperture of the information-carrying disc, and the one housing member and the other housing member have a locking device serving to fix them together temporarily. The characteristic feature of the invention is that the other housing member (32) has a pressure zone (32c), and in the closed state of the housing (30) the pressure zone (32c) of the other housing member (32) is positioned on the side of the central aperture (11) of the information-carrying disc (10) opposite the supporting zone (31c) of the one housing member (31), in practice in the projection of the central opening (11), the locking device (40) has one fixing body (41) positioned in the supporting zone (31c) of the one housing member (31) and another fixing body (42) positioned in the pressure zone (32c) of the other housing member (32). In the closed state of the housing (30) of the one fixing body (41) and the other fixing body (42) one of them has a locking pin (43) passing through the storage space (33), while the other has a clamping device (44) serving to accept and hold the locking pin (43), and in the closed state of the housing (30) the locking pin (43) is temporarily fixed into the clamping device (44) after being passed through the central aperture (11) of the information-carrying disc (10).

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### Goods protection unit

The subject of the invention relates to a goods protection unit against the theft of information-carrying discs with a central aperture, especially CD and DVD discs, which has a housing surrounding the storage space that is suitable for accepting the information-carrying disc, the housing has one housing member and another housing member that can be moved as compared to it, the one housing member and/or the other housing member has a clamping part-unit serving to temporarily hold the information-carrying disc on the inside facing the storage space, furthermore, the one housing member has a supporting zone, and in the closed state of the housing the supporting zone is positioned in the projection of the central aperture of the information-carrying disc, and the one housing member and the other housing member have a locking device serving to fix them together temporarily.

Today, as a consequence of the development of data recording pre-recorded CD and DVD discs have become widely available on which pre-recorded and stored sound and picture information, e.g. music recording and films are sold. Such data carriers – in the interest of protecting them against physical damage – are distributed in storage boxes or protective cases. In the stores where the sale of these is carried out goods protection devices are affixed to these boxes in order to avoid shoplifting.

The known goods protection device in the case of pre-recorded CD-s and DVD-s are formed by at least partly transparent boxes in the internal space of which the protective cases and signal generators that set off suitable alarm equipment are placed. Two pieces that may be separated are placed on the boxes, and in their closed state they are fixed together with a locking device that may only be unlocked using special equipment. Such solutions are contained in patent specifications Nos. EP 402.822, US 5.904.246, US 5.901.840, US 5.850.752, US 5.598.728 and FR 2.688.483.

The basic disadvantage of such constructions, however, is that in essence they surround the protective case, so in the case pulling apart the goods protection box or damaging it, the information-carrying disc placed in the protective case becomes easily accessible, and may be stolen without being damaged without paying the purchase price.

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Another disadvantage to be listed is that the box used as a goods protection unit causes further costs for the organisation carrying out the sale, as without this box the product can not be protected effectively. And as a final result the extra cost of goods protection raises the price of the product.

A further disadvantage is that the goods protection box surrounding the protective case increases the space required for the article that is to be sold, which causes the relative reduction of the sales floor area of the store.

Another unfavourable feature is that before the products are displayed in the sales area that always have to be placed in the goods protection boxes, this means extra physical work and so reduces the time of the staff they could spend on other activities, so making reaching the desired sales turnover difficult.

Our aim with the invention was to overcome the deficiencies of the known solutions and to create a goods protection unit that provides effective protection of information-carrying discs against unauthorised theft with a small cost, minimal extra space requirement and simple operation.

The recognition that led us to the construction according to the invention was that if the protective case servicing to hold the information-carrying disc is made in a slightly different way to usual, and if this protective case is combined with a unique locking device that, apart from fixing together the parts of the protective cases, goes through the aperture in the middle of the information-carrying disc, then the protective case and the locking device – without a special key that opens the lock – can not be separated without damaging the information-carrying disc, in other words the information-carrying disc can not be removed from the protective case, so the protective case itself is used as a goods protection box, and so the task can be solved.

In accordance with the set aim the goods protection unit against the theft of information-carrying discs with a central aperture, especially CD and DVD discs, – which has a

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housing surrounding the storage space that is suitable for accepting the information-carrying disc, the housing has one housing member and another housing member that can be moved as compared to it, the one housing member and/or the other housing member has a clamping part-unit serving to temporarily hold the information-carrying disc on the inside facing the storage space, furthermore, the one housing member has a supporting zone, and in the closed state of the housing the supporting zone is positioned in the projection of the central aperture of the information-carrying disc, and the one housing member and the other housing member have a locking device serving to fix them together temporarily, -- is formed so that the other housing member has a pressure zone, and in the closed state of the housing the pressure zone of the other housing member is positioned on the side of the central aperture of the information-carrying disc opposite the supporting zone of the one housing member, in practice in the projection of the central opening, the locking device has one fixing body positioned in the supporting zone of the one housing member and another fixing body positioned in the pressure zone of the other housing member, in the closed state of the housing of the one fixing body and the other fixing body one of them has a locking pin passing through the storage space, while the other has a clamping device serving to accept and hold the locking pin, and in the closed state of the housing the locking pin is temporarily fixed into the clamping device after being passed through the central aperture of the information-carrying disc.

A further criterion of the goods protection unit according to the invention is that the supporting zone of the one housing member has a first penetration opening, while the pressure zone of the other housing member has a second penetration opening, and in the closed state of the one housing member and the other housing member the first penetration opening and the second penetration opening are positioned one above the other, and the second penetration opening falls in the projection of the central aperture of the information-carrying disc.

In a possible version of the goods protection unit the supporting zone of the one housing member has a first penetration opening, and in the closed state of the one housing member and the other housing member the first penetration opening falls in the projection of the central aperture of the information-carrying disc and/or the pressure zone of the other

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housing member has a second penetration opening, and in the closed state of the one housing member and the other housing member the second penetration opening falls in the projection of the central aperture of the information-carrying disc.

In a still further version of the invention the clamping part-unit of the one housing member is positioned in the supporting zone of the one housing member, and the clamping part-unit has fixing claws that fit into the central aperture of the information-carrying disc. The first penetration opening of the supporting zone of the one housing member is formed in the clamping part-unit.

In a different construction form of the goods protection unit the clamping device of the one fixing body is firmly positioned in the clamping part-unit, while the locking pin of the other fixing body is placed in the housing in such a way that it may be removed.

From the point of view of the invention it may be favourable if one end of the locking pin has a disc-like stopper fixed to it, and in the closed state of the housing the stopper is fixed up to the external surface of the housing, and the other end of the locking pin is fed through the second penetration opening, and/or the first penetration opening and locked temporarily in the clamping device of the one fixing body.

The goods protection unit according to the invention has numerous advantageous features. The most important of these is that the novel formation of the housing serving to hold the information-carrying disc provides the possibility to realise the goods protection of pre-recorded CD-s and DVD-s more completely than is usual.

Here it is the protective case of the information-carrying disc that forms the goods-protection box, which, as compared to the earlier solutions containing two boxes, results in part in significant materials and manufacturing cost savings and in a space requirement reduction and, on the other part, it results in the reduction of the time required to provide the information-carrying disc with goods protection. This reduction of physical work requirement can bring about a favourable change in specific operation costs, as the time saved here may be spent by the staff in carrying out other useful activities.

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An advantage in connection with the previous one is that due to the novel construction following purchase at the cash desk, the locking device may be simply removed from the housing in a very short period of time, so customer service can be accelerated, which can indirectly lead to the increase of turnover.

Another advantage is that the novel construction also reduces the number of theft attempts in which an attempt is made to damage the goods protection box. As in the case of the version according to the invention in the case of damaging the housing of the information-carrying disc the information-carrying disc itself becomes damaged, which makes this attempt pointless. This also reduces the amount of intentional damage to goods protection units, which leads to further cost savings.

In the following the goods protection unit according to the invention will be presented in detail in connection with construction examples, on the basis of drawings. On the drawing

Figure 1 shows a version of the goods protection unit in three-dimensional view, in partial cross section,

Figure 2 shows a side view of a different version of the goods protection unit, in cross section,

Figure 3 shows a detail of a different version of the goods protection unit in side view, in cross section.

Figure 1 shows a possible version of the goods protection unit 20 according to the invention. It can be observed that the information-carrying device 10, known in itself, that has a central aperture 11 is positioned in the storage space 33 of the housing 30 of the goods protection unit 20. The housing 30 consists of one housing member 31 and another housing member 32, the combination of which surrounds the storage space 33. The formation of the one housing member 31 of the housing 30 is such that – in a way that is usual and known in itself – it supports the information-carrying disc 10, around its external edge, and also attaches itself to the central aperture 11 of the information-carrying disc with the help of the fixing claws 34a of the clamping part-unit 34 extending from the

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internal side 31a of the one housing member 31 towards the storage space 33 of the housing 30, and so holds it immobile when fixed to the one housing member 31.

Figure 1 also shows that the one housing member 31 has a supporting zone 31c, which here partly carries the clamping part-unit 34, and partly includes the first penetration opening 31d as well. The first penetration opening 31d links the internal side 31a of the one housing member 31 and the external side 31b, and is so positioned that it is precisely in the projection of the central aperture 11 of the information-carrying disc 10 held in the one housing member 31 perpendicular to the internal side 31a of the one housing member 31, just like the supporting zone 31c. The second penetration opening 32d can be found in the pressure zone 32c of the other housing member 32 opposite the first penetration opening 31d of the one housing member 31 of the housing 30, which links the internal side 32a of the other housing member 32 to the external side 32b. It is evident that due to the relative positions of the first penetration opening 31d and the second penetration opening 32d, the second penetration opening 32d and the pressure zone 32c are also in the projection of the central aperture 11 of the information-carrying disc 10 perpendicular to the internal side 32a of the other housing member 32. This is advantageous from the point of view of the realisation and handling, but is not an essential requirement. A version can also be imagined in which the pressure zone 32c of the other housing member 32 does not fall in the projection of the central opening 11 of the information-carrying disc 10 perpendicular to the internal side 32a of the other housing member 32. Due to this the solution may still be used, only the form of the locking pin 43 and the fixing together of the two members of the housing 30 become complex.

The supporting zone 31c of the one housing member 31 of the housing 30 is of such a form that a depression may be found formed by the clamping part-unit 34 on the external side 31b of the one housing member 31, into which the one fixing body 41 of the locking device 40 fits. The one fixing body 41 is of such a form that taking into consideration its size and form it just fits into the depression on the external side 31b of the one housing member 31 and does not hang outside of the external surface 35 of the housing 30.



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Beside the one fixing body 41 the locking device 40 should also contain the other fixing body as well, which in the case of this construction example consists of the locking pin 43 and the stopper 45. The one end 43a of the locking pin 43 is embedded in the stopper 45, while the formation of the other end 43b makes it possible for it to work together with the clamping device 44 positioned in the one fixing body 41.

Figure 1 also shows well that the stopper 45 of the other fixing body 42 of the locking device 40 touches the pressure zone 32c of the external side 32b of the other housing member 32, and is fixed to it. The other end 43b of the locking pin 43 of the other fixing body 42, however, is fixed into the clamping device 44 of the one fixing body 41 after being fed through the central aperture 11 of the information-carrying disc 10 and the first penetration opening 31d of the one housing member 31.

So in this state of the locking device 40 the locking pin 43 – with the help of the clamping device 44 of the one fixing body 41 and the stopper 45 of the other fixing body 42 – does not only fix the one housing member 31 of the housing 30 to the other housing member 32, but also links the information-carrying disc to these so that it can not be taken out.

When using the goods protection unit 20 according to figure 1 we first connect the information-carrying disc 10 to the one housing member 31 using the clamping part-unit 34 of the one housing member 31 of the open housing 30, then the other housing member 32 of the housing 30 is placed onto the one housing member 31. Following this the one fixing body 41 of the locking device 40 is fitted to the one housing member 31. We have to note here that it can be imagined that the one fixing body 41 of the locking device 40 is fitted into the seat of the clamping part-unit 34 before the information-carrying disc 10 is placed into the one housing member 31, and in a given case the one housing member 31 of the housing may be manufactured so that the one fixing body 41 is built into the supporting zone 31c of the one housing member 31 in such a way that it may not be removed.

After the one housing member 31 of the housing 30 and the other housing member 32 have been fitted together the other end 43b of the locking pin 43 belonging to the other fixing body 42 of the locking device is fitted into the other penetration opening 32d of the

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pressure zone 32c of the other housing member 32, and is pushed through the storage space 33 of the housing 30 so that the other end 43b of the locking pin 43 passes through the central aperture 11 of the information-carrying disc 10 and goes into the first penetration opening 31d of the supporting zone 31c of the one housing member 31. When the other end 43b of the locking pin 43 passes through the first penetration opening 31d of the one housing member 31, then it passes into the clamping device 44 of the one fixing body, and there it is locked into the one fixing body 41 so locking up the locking device 40. When locking the other end 43b of the locking pin 43 the stopper 45 at the one end 43a of the locking pin 43 rest upon the pressure zone 32c of the other housing member 32 of the housing 30 and with this it prevents the one housing member 31 of the housing 30 being separated from the other housing member 32.

It also should be mentioned that the locking device 40 may include a signal generator, not marked in figure 1, the task of which is to set off the alarm equipment in the case of unauthorised theft. A version can also be imagined in which the signal generator is placed in either the one fixing body 41 or the other fixing body 42 of the locking device 40, the one that may be removed from the housing 30 of the good protection unit 20 at the cash desk.

When the housing 30 needs to be made openable, e.g. after the product has been purchased, at the cash desk, then lock existing between the clamping device 44 of the other fixing body 42 and the other end 43b of the locking pin 43 is released using a special opening device, then we pull back the locking pin 43 of the other fixing body 42, by removing the stopper 45 from the pressure zone 32c of the other housing member 32, through the first penetration opening 31d of the one housing member 31, the central aperture 11 of the information-carrying disc 10 and the second penetration opening 32d of the other housing member 32 and so the other housing member 32 is freed.

Now looking at figure 2 it shows a goods protection unit 20, which also contains a housing 30 consisting of a separable one housing member 31 and other housing member 32, and in the information-carrying disc 10 can be placed in its storage space 33. But in this case the clamping part-unit 34 fixing the information-carrying disc 10 to the one housing member

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31 is not situated at the central aperture 11 of the information-carrying disc 10, but at the edge of the information-carrying disc 10.

However, in this case too there is a supporting zone 31c in the projection of the central aperture 11 of the information-carrying disc perpendicular to the one housing member 31, and there is a pressure zone 32c in its projection perpendicular to the other housing member 32. It is also a difference that the one fixing body 41 situated in the supporting zone 31c of the one housing member 31 is built in the material of the one housing member 31, on the internal side 31a of the one housing member 31. The one end 43a of the locking pin 43 is fixed in the internal side 32a of the other housing member, in the pressure zone 32c of the other housing member. In the case of this construction example the other fixing body only consists of the locking pin 43. The clamping device 44 in which the other end 43b of the locking pin 43 can be clamped belongs to the one fixing body 41 of the locking device 40.

However, it can also be seen in figure 2 that the locking pin 43 forming the other fixing body 42 of the locking device 40 goes through the central aperture 11 of the information-carrying disc fixing the other housing member 32 to the one housing member in this way. However, it must be pointed out that in the case of this construction example of the goods protection unit 20 there is no one penetration opening 31d on the one housing member 31 and there is no other penetration opening 32d on the other housing member 32 either. It must also be mentioned that practically the locking pin 43 should be fixed in the pressure zone 32c of the other housing member 32 in a way that it can be lifted out of there when necessary. Obviously a construction should be chosen that only makes it possible to remove the one end 43a of the locking pin 43 from the other housing member 32 when the housing is open, from the internal side 32a of the other housing member 32.

During the use of the goods protection unit 20 as in figure 2 the locking device operates in the same way as described in connection with figure 1. The only difference is that the locking pin 43 of the other fixing body 42 cannot be lifted out of the other housing member 32. As a result of this when the other housing member 32 is fitted to the one housing member 31, at the same time the other fixing body 42 and the other fixing body 41 are

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locked together too. When the housing 30 is opened, the clamping device 44 of the one fixing body 41 is released by the locking pin 43 of the other fixing body 42, and at the same time the other housing member 32 is separated from the one housing member 31.

Figure 3 shows a part of the goods protection unit 20, where the one fixing body 41 of the locking device 40 is situated in the pressure zone 32c of the other housing member 32 of the housing in a way that the one fixing body 41 is attached to the internal side 32a of the other housing member 32. In this case again the other housing member 32 does not have another penetration opening 32d. The other fixing body 42 of the locking device 40 consists of the locking pin 43 and a stopper 45 attached to the one end 43a of the locking pin 43. In this case the stopper 45 is situated on the external side 31b of the one housing member 31, in the supporting zone 31c of the one housing member 31. In this supporting zone 31c there is also the one penetration opening 31d connecting the internal side 31a and the external side 31b of the one housing member 31, suitable for letting through the locking pin of the other fixing body 42 of the locking device. The locking pin 43 goes through the penetration opening 31d, enters the storage space 33 of the housing 30 and goes through the central aperture 11 of the information-carrying disc placed in there, then the other end 43b of the locking pin 43 stops in the clamping device 44 of the one fixing body 41.

Figure 3 also shows that the supporting zone 31c of the one housing member 31 and the pressure zone 32c of the other housing member 32 are in the projection of the central aperture 11 of the information-carrying disc 10 situated in the storage space 33 of the housing, perpendicular to the one housing member 31 and the other housing member 32.

In the case of this construction example the information-carrying disc is held in a position attached to the one housing member 31 by fixing claws 34a fitting into the central aperture 11 of the information-carrying disc 10. The fixing claws 34a form a part of the clamping part-unit 34, which – in a similar way as described in connection with figure 1 – is situated in the supporting zone 31c of the one housing member 31, on the internal side 31a of the one housing member 31.

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During the use of goods protection unit 20 as in figure 3, when the one housing member 31 and the other housing member 32 of the housing 30 are clamped to each other first the other housing member 32 is fitted on the one housing member 31 and then the other end 43b of the locking pin 43 of the other fixing body 42 of the locking device 40 is pushed into the one penetration opening 31d of the one housing member 31. The other end 43b of the locking pin 43 going in the one penetration opening 31d enters the storage space 33 where it goes through the central aperture 11 of the information-carrying disc 10 and arrives in the clamping device 44 of the one fixing body 41 mounted on the internal side 32a of the other housing member 32, where its position is fixed.

When the locking device 40 is released, after opening the clamping device 44 the other end 43b of the locking pin 43 is freed and the locking pin can be easily pulled out through the one penetration opening 31d of the one housing member 31 from the storage space 33 of the housing 30. Following this the one housing member 31 and the other housing member 32 can be separated from each other.

On the basis of the construction examples described it can be seen that the goods protection unit 20 according to the invention can be produced in numerous significantly different versions too. However, in every case it is important that the supporting zone 31c of the one housing member 31 and the one fixing body 41 situated in it, and the pressure zone 32c of the other housing member 32 and its other fixing body 42 are exactly in the projection of the central aperture 11 of the information-carrying disc 10 to be protected, and that the locking device 40 has a locking pin 43 connecting the one housing member 31 and the other housing member 32 in a way that it goes through the central aperture 11 of the information-carrying disc 10.

The goods protection unit according to the invention can be favourably used for the anti-theft protection of CD-s and DVD-s.

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List of references

10 information-carrying device	11 central aperture
20 goods protection unit	
30 housing	31 one housing member
	31a internal side
	31b external side
	31c supporting zone
	31d first penetration opening
	32 another housing member
	32a internal side
	32b external side
	32c pressure zone
	32d second penetration opening
	33 storage space
	34 clamping part-unit
	34a fixing claw
	35 external surface
40 locking device	41 one fixing body
	42 another fixing body
	43 locking pin
	43a one end
	43b other end
	44 clamping device
	45 stopper

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### Claims

1. A goods protection unit against the theft of information-carrying discs with a central aperture, especially CD and DVD discs, which has a housing surrounding the storage space that is suitable for accepting the information-carrying disc, the housing has one housing member and another housing member that can be moved as compared to it, the one housing member and/or the other housing member has a clamping part-unit serving to temporarily hold the information-carrying disc on the inside facing the storage space, furthermore, the one housing member has a supporting zone, and in the closed state of the housing the supporting zone is positioned in the projection of the central aperture of the information-carrying disc, and the one housing member and the other housing member have a locking device serving to fix them together temporarily, characterised by that the other housing member (32) has a pressure zone (32c), and in the closed state of the housing (30) the pressure zone (32c) of the other housing member (32) is positioned on the side of the central aperture (11) of the information-carrying disc (10) opposite the supporting zone (31c) of the one housing member (31), in practice in the projection of the central opening (11), the locking device (40) has one fixing body (41) positioned in the supporting zone (31c) of the one housing member (31) and another fixing body (42) positioned in the pressure zone (32c) of the other housing member (32), in the closed state of the housing (30) of the one fixing body (41) and the other fixing body (42) one of them has a locking pin (43) passing through the storage space (33), while the other has a clamping device (44) serving to accept and hold the locking pin (43), and in the closed state of the housing (30) the locking pin (43) is temporarily fixed into the clamping device (44) after being passed through the central aperture (11) of the information-carrying disc (10).

2. The goods protection device according to claim 1 characterised by that the supporting zone (31c) of the one housing member (31) has a first penetration opening (31d), while the pressure zone (32c) of the other housing member (32) has a second penetration opening (32d), and in the closed state of the one housing member (31) and the other housing member (32) the first penetration opening (31d) and the second penetration opening (32d)

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are positioned one above the other, and the second penetration opening (32d) falls in the projection of the central aperture (11) of the information-carrying disc (10).

3. The goods protection device according to claim 1 characterised by that the supporting zone (31c) of the one housing member (31) has a first penetration opening (31d), and in the closed state of the one housing member (31) and the other housing member (32) the first penetration opening (31d) falls in the projection of the central aperture (11) of the information-carrying disc (10).

4. The goods protection device according to claim 1 or 3 characterised by that the pressure zone (32c) of the other housing member (32) has a second penetration opening (32d), and in the closed state of the one housing member (31) and the other housing member (32) the second penetration opening (32d) falls in the projection of the central aperture (11) of the information-carrying disc (10).

5. The goods protection device according to any of claims 1 – 4 characterised by that the clamping part-unit (34) of the one housing member (31) is positioned in the supporting zone (31c) of the one housing member (31), and the clamping part-unit has fixing claws (34a) that fit into the central aperture (11) of the information-carrying disc (10).

6. The goods protection device according to claim 5 characterised by that the first penetration opening (31d) of the supporting zone (31c) of the one housing member (31) is formed in the clamping part-unit (34).

7. The goods protection device according to claim 5 or 6 characterised by that the clamping device (44) of the one fixing body (41) is firmly positioned in the clamping part-unit (34), while the locking pin (43) of the other fixing body (42) is placed in the housing (30) in such a way that it may be removed.

8. The goods protection device according to claims 2 – 7 characterised by that one end (43a) of the locking pin (43) has a disc-like stopper (45) fixed to it, and in the closed state of the housing (30) the stopper (45) is fixed up to the external surface (35) of the housing



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(30), and the other end (43b) of the locking pin (43) is fed through the second penetration opening (32d), and/or the first penetration opening (31d) and locked temporarily in the clamping device (44) of the one fixing body (41).

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Fig. 2 is a cross-sectional view of a multi-layered structure. It shows a central core (10) surrounded by multiple layers (20, 30, 31, 32, 33, 34). A central opening (40) is present, with various internal features labeled 31a, 31b, 31c, 31d, 32a, 32b, 32c, 32d, 33a, 33b, 33c, 33d, 34a, 34b, 34c, 34d, 41, 42, 43, 43a, 43b, 43c, 43d, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.

Fig. 3 is a cross-sectional view of a similar multi-layered structure, showing a different internal configuration. It includes a central core (10) and surrounding layers (20, 30, 31, 32, 33, 34). The central opening (40) is surrounded by a complex arrangement of internal features labeled 31a, 31b, 31c, 31d, 32a, 32b, 32c, 32d, 33a, 33b, 33c, 33d, 34a, 34b, 34c, 34d, 41, 42, 43, 43a, 43b, 43c, 43d, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.

## INTERNATIONAL SEARCH REPORT

International Application No.  
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<b>A. CLASSIFICATION OF SUBJECT MATTER</b> IPC 7 E05B73/00 G11B33/04		
According to international Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b> Minimum documentation searched (classification system followed by classification symbols) IPC 7 E05B G11B  Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  Electronic data base consulted during the international search (name of data base and, where practical, search terms used) EPD-Internal		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
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	figures 1,2	
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<input checked="" type="checkbox"/> Further documents are listed in the continuation of box C. <input checked="" type="checkbox"/> Patent family members are listed in annex.		
<b>* Special categories of cited documents:</b> "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" documents which may throw doubts on priority claim(s) or which is cited to establish the publication date of another claim or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "Z" document member of the same patent family		
Date of the actual completion of the international search 7 July 2004		Date of making of the international search report 30/07/2004
Name and mailing address of the ISA European Patent Office, P.O. 6818 Patentbusch 2 NL - 2220 HV Rijswijk Tel. (+31-70) 340-2040, Tr. 31 651 epo nl, Fax (+31-70) 340-3016		Authorized officer PEREZ MENDEZ, J

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